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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,286	02/26/2002	Atsushi Takane	H6808.0004/P004	5346

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EXAMINER
JOHNSTON, PHILLIP A

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 04/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/082,286	Applicant(s) TAKANE ET AL.	
	Examiner Phillip A Johnston	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 February 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Detailed Action

Examiners Response to Arguments

1. Claims 1-25, as amended are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,154,714, to Lepejian, in view of Okubo et al, U. S. Patent No. 5,872,862, for the reasons given in First Office Action (Paper No. 6).

2. Applicant's arguments filed 2-12-2003 have been fully considered but they are not persuasive.

Arguments 1 and 2.

Applicant states that "Lepejian and Okubo, fail to teach or suggest "peforming a matching process, by using the template with respect to a pattern within an image provided by the scanning electron microscope system" and "re-registering a portion of the image that corresponds to the template as a template" as recited in Claim 1.
The applicant is respectfully directed to Lepejian (714), Column 5, line 45-50, which states; Using wafer definition file 30 and the location (in x,y or other coordinate system) of identified defects, the defects can be filtered by die and by the subregion of a die where the defect is located.

Also Column 7, line 22-25, which states; In this first approach, the wafer definition file is processed to extract all nets by reading in a net list file such as a

SPICE file or by direct extraction from the GDSII file. The extraction of all nets results in a connectivity graph of the design.

As well as, Column 8, line 23-30, which states; when comparisons are made between historical defects and the defect being analyzed, weights are assigned to each of the historical defects, depending upon the relative similarities between any given defects. Each defect is "added" to the layout as a polygon with its positional and knowledge based derived attributes to determine if its introduction can cause a change to the net list.

The examiner has interpreted from the Lepejian (714) references above that a comparison is made between SEM images and CAD data, and when a defect image is "added" to the layout, a portion of the image is being re-registered in the wafer definition file.

The applicant is also respectfully directed to Okubo (862), Column 1, line 55-67 and Column 2, line 1-13, which states; provides a pattern matching apparatus that scans a sample with an electron beam to provide a secondary electron image involving wiring patterns, and matches the wiring patterns of the secondary electron image with wiring patterns prepared from CAD data. The apparatus comprises means for detecting the positions of edges of the CAD wiring patterns extending in parallel with an axis Y of a rectangular coordinate system defined on the CAD data, means for storing the secondary electron image, means for accumulating luminance of the secondary electron image along an axis Y of a rectangular coordinate system defined on the secondary electron image, to provide a projected luminance distribution, means

for determining edge likelihood of the secondary electron image according to the projected luminance distribution, means for finding the degree of correlation between the edge positions of the CAD data and the edge likelihood of the secondary electron image as a pattern matching level, and means for shifting the edge positions of the CAD wiring patterns within a predetermined range according to secondary electron image magnification accuracy, sample positioning accuracy, and fluctuations in the width of wiring, to find a maximum pattern matching level, and finding a secondary electron image magnification error and a sample positioning error corresponding to the maximum pattern matching level.

The applicant is further respectfully directed to Column 35, line 6-15 in Okubo (862), which states; According to the threshold determined, the binary processing unit 430 converts the edge image 428 provided by the edge extractor 426 into a binary edge image 440, which is supplied to the matching unit 444 to provide projected data. At the same time, the matching unit 444 prepares projected edge data according to the mask data 442 provided by the mask data storage unit 432. The matching unit 444 carries out a pattern matching operation on the projected edge data prepared from the binary edge image 440 and the reference projected edge data prepared from the mask data 442. According to a result of the matching operation, the electron beam unit 410 finds a deviation between the positions of the sample LSI 414 and electron beam 412. Namely, according to the output signal 446 from the matching unit 444, the positions of the sample LSI 414 and electron beam 412 are corrected relative to each other. More

precisely, the beam deflection means 456 in the electron beam unit 410 is activated according to the output signal 446, to correctly orient the electron beam 412 toward the sample LSI 414.

The examiner has interpreted from the Okubo (862) references above, that a matching process, is clearly performed by Okubo (862) using the template with respect to a pattern within an image provided by the scanning electron microscope system.

As for "re-registering of the template as template", the applicant is again respectfully directed to Okubo (862) Column 30, line 59-67; where FIG. 36(A) shows the object image 514 of a semiconductor integrated circuit device. The object image 514 includes a wiring pattern 514a. Edges of this wiring pattern 514a are going to be extracted and subjected to a pattern matching operation. Steps S1 to S6 of FIG. 35 compute the blur level k of the image data D1 of the object image 514. Steps S7 and S8 detect edges in the object image 514 according to the blur level k, and step S9 carries out a pattern matching operation.

Also in Column 34, line 48-56, which states; Namely, the contents of the first frame memory 524a are copied into the second frame memory 524b, and the contents of the second frame memory 524b are delayed by k/2 pixels from the contents of the first frame memory 524a. The delayed image data D12 are provided to the ALU 521, which calculates the estimated edge data. For example, an absolute difference of pixels delayed by k/2 pixels is found and again stored in the first frame memory 524a.

The examiner has interpreted from the Okubo (862) references above, that after computing the blur level of the image (by calculating the estimated edge data via pixel delay) the absolute difference is again stored in the first frame memory of the scanning electron microscope. This is equivalent to "re-registering a portion of the image that corresponds to the template as a template". In other words when the projected edge data is re-registered in the first frame memory of the SEM, it becomes the corrected image (the template) to compare to the CAD data.

Conclusion

3. The Amendment filed on 1-03-2003 under 37 CFR 1.131 has been considered but is ineffective to overcome the Lepejian (714) and Okubo (862) references.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phillip A Johnston whose telephone number is 305 7022. The examiner can normally be reached on 7:30 to 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 703 308 4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9318 for regular communications and 703 872 9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

PJ
March 28, 2003

JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800